DRAFT February 2008

Calculation of Potential Risk from Consumption of Breast Milk

Chemical	Cf (mg/kg)	SFo (mg/kg/day)-1	RfD (mg/kg/day)	h (days)	Mother ADDm (mg/kg/day)	Milk Cmf (mg/kg-lipid)	Infant ADDca-i (mg/kg/day)	Infant ADDnc-i (mg/kg/day)	Child ADDca-c (mg/kg/day)	Child ADDnc-c (mg/kg/day)		Mother ELCRm	Infant ELCRi	Child ELCRi	Infant & Child ELCR	Mother HQm	Infant HQi	Child HQi	Infant & Child HQ
PCBs	1.6	2	0.00002	2555	0.0034	38	0.00208	0.024	0.00005	0.0006		3.0E-03	4.2E-03	1.1E-04	4.3E-03	172	1215	32	201
									Factor above acceptable level		=	2951	4165	110	4275	172	1215	32	201
PCBs TEQ	1.90E-05	1.50E+05	NA	2555	4.1E-08	4.5E-04	3.5E-08	4.1E-07	6.5E-10	7.6E-09		2.6E-03	5.2E-03	9.8E-05	5.3E-03				
									Factor above acceptable level		=	2628	5231	98	5329				
Dioxin TEQ	5.10E-06	1.50E+05	NA	2555	1.1E-08	1.2E-04	9.4E-09	1.1E-07	1.7E-10	2.0E-09		7.1E-04	1.4E-03	2.6E-05	1.4E-03				
									Factor above acceptable level		=	705	1404	26	1430				
DDT	0.07	0.34	0.0005	120	0.0002	0.08	6.0E-06	7.0E-05	2.4E-06	2.8E-05		2.2E-05	2.1E-06	8.2E-07	2.9E-06	0.30	0.14	0.056	0.068
									Factor above acceptable level		=	22	2.1	1	3	0.30	0.14	0.056	0.068

Notes:

Site-wide, whole-body 95UCL concentration in small mouth bass (Cf) taken from Round 2 Report, Appendix F, Table 3-14.

Acceptable levels are ELCR = 1E-6 and HQ = 1

ELCRm adjusted to 30-year exposure

Equations

ADDm = (Cf x Irf x Conv x Ff) / BWm

ADDca-i = (Cmf x Irm x f3 x f4 x Edi x Efi) / (Ati x BWi)

ADDca-i = (Cf x Irfc x Conv x Ff x Edc x Efc) /(Atc x BWc)

ELCRm = ADDm x Sfo

ELCRi = ADDca-i x Sfo

ELCRc = ADDca-c x Sfo

Cmf = (ADDm x h x f1) / (ln2 x f2)

ADDnc-i = (Cmf x Irm x f3 x f4 x Edi x Efi) / (Atni x BWi)

ADDnc-c = (Cf x Irfc x Conv x Ff) / BWc

HQm = ADDm / RfD

HQi = ADDnc-i / RfD

HQc = ADDnc-c / RfD

Default Values

Cf	chemical specific	mg/kg	Concentration of chemical in fish
Irf	142	mg/day	Mother's ingestion rate of fish
Conv	0.001	kg/mg	Conversion factor
Ff	1	fraction	Fraction of fish contaminated
BWm	66	kg	Body weight of mother
h	chemical specific	days	Half-life of chemical in body
Fone	0.9	fraction	Fraction of ingested chemical stored in fat
Ftwo	0.3	fraction	Fraction of mother's weight that is fat
Irm	1	kg/day	Infant's ingestion rate of milk
Fthree	0.04	fraction	Fraction of breast milk that is fat
Ffour	0.9	fraction	Fraction of ingested chemical that is absorbed
Edi	1	year	Exposure duration of breast-feeding infant
Efi	365	days/year	Exposure frequency of breast-feeding infant
Atc	25550	days	Averaging time - carcinogens (70 years)
Atnc	2190	days	Averaging time - noncarcinogens (ED x EF)
Bwi	9.4	kg	Body weight of infant
Sfo	chemical specific	(mg/kg/day)-1	Slope Factor - oral
RfD	chemical specific	mg/kg/day	Reference Dose - oral
Edc	6	years	Exposure duration of child
Efc	365	days/year	Exposure frequency of child
BWc	40	kg	Body weight of child
Irfc	16	g/day	Ingestion rate of fish by child

Calculated Values

ADDm	mg/kg/day	Average Daily Dose to mother
Cmf	mg/kg-lipid	Chemical concentration in milkfat
ADDca-i	mg/kg/day	Average Daily Dose to breast-feeding infant, cancer
ADDnc-i	mg/kg/day	Average Daily Dose to breast-feeding infant, non-cancer
ADDnc-c	mg/kg/day	Average Daily Dose to child, non-cancer
ELCRm	risk	Excess Lifetime Cancer Risk to mother
ELCRi	risk	Excess Lifetime Cancer Risk to infant
ELCRc	risk	Excess Lifetime Cancer Risk to child
HQm	quotient	Hazard Quotient to mother
HQi	quotient	Hazard Quotient to infant
HQc	quotient	Hazard Quotient to child